Support to Private Sector Telecommunications Activities:

Cooperative Research with Industry

Outputs

- PC software (VQM) that objectively measures video quality made available on the Internet for evaluation.
- Mobile, broadband measurements of propagation in urban and suburban environments made available to Lucent Bell Laboratories for research into the performance of multiple input multiple output (MIMO) antenna systems.

The Federal Technology Transfer Act of 1986 (FTTA), as amended, allows Federal laboratories to enter into cooperative research agreements with private industry, universities, and other interested parties. The law was passed in order to provide laboratories with clear legal authority to enter into these arrangements and thus encourage technology transfer from Federal laboratories to the private sector. Under this Act, a cooperative research and development agreement (CRADA) can be implemented that protects proprietary information, grants patent rights, and provides for user licenses to corporations, while allowing Government expertise and facilities to be applied to interests in the private sector.

ITS participates in technology transfer and commercialization efforts by fostering cooperative telecommunications research with industry where benefits can directly facilitate U.S. competitiveness and market opportunities. ITS has participated for a number of years in CRADAs with private sector organizations to design, develop, test, and evaluate advanced telecommunication concepts. Research has been conducted under agreements with:

- American Automobile Manufacturers Association
- ARINC
- AudioLogic, Inc.
- Bell South Enterprises
- Bell Atlantic Mobile Systems
- East Carolina University's Brody School of Medicine
- FirstRF Corporation
- General Electric Company
- GTE Laboratories Inc.
- Hewlett-Packard Company (HP)
- Integrator Corporation
- Intel Corporation
- Lehman Chambers
- Lucent Digital Radio
- Lucent Technologies
- Motorola/Freescale Inc.
- Netrix Corporation
- RF Metrics
- Savi Technologies
- Spectrum Mapping LLC
- Telesis Technology Laboratories
- University of Colorado
- University of Pennsylvania
- US WEST Advanced Technologies
- US WEST New Vector Group

Not only does the private sector partner benefit, but the Institute is able to undertake research in commercially important areas that it would not otherwise be able to do. Active CRADAs in FY 2004 are described below.

Lucent Technologies, Bell Laboratories, and ITS completed cooperative research to evaluate the performance of multiple input multiple output (MIMO) antenna systems for mobile wireless communications. MIMO technology promises to greatly increase spectrum capacity for wireless services including high data rate mobile services.

Motorola/Freescale, Inc., and ITS made measurements to determine the potential for interference from several ultrawideband (UWB) and other signals to existing spectrum users. Two of the UWB signals studied were being considered for the IEEE standard for Personal Area Networks. The results of this work were important inputs to the IEEE standard and the FCC's rulemaking regarding UWB.

Savi Technologies and ITS measured the mutual effects between an RF identification (RFID) system and FM amateur radio equipment in the 400-MHz band.

In FY 2004, ITS received 172 new requests for copies of ITS' Video Quality Metric (VQM) software for evaluation purposes. This software objectively measures video quality as it would be perceived by end-users of a video system. ITS's VQM, already a national standard (ANSI), was made an international standard by the International Telecommunication Union. Commercial licensing of the VQM technology is available with reasonable

ITS and Savi Technologies staff at the Table Mountain field site, preparing to measure the mutual effects between an RFID and FM amateur radio equipment in the 400-MHz band (photograph by F.H. Sanders).

and equitable terms. Two new VQM commercial licenses were issued last year.

In FY 2004, ITS had 140 active accounts with the private sector for use of its Telecommunications Analysis Services (TA Services). TA Services consists of a number of wireless databases and propagation models that can be used on a reimbursable basis.

Cooperative research with private industry has helped ITS accomplish its mission to support industry's productivity and competitiveness by providing insight into industry needs. This has led to adjustments in the focus and direction of other Institute programs to improve their effectiveness and value.

ITS is interested in assisting private industry in all areas of telecommunications. The pages of this technical progress report reveal many technological capabilities that may be of value to various private sector organizations. Such organizations are encouraged to contact ITS if they believe that ITS may have technology useful to them. Because of the great commercial importance of many new and emerging telecommunication technologies, including third generation wireless (3G), wireless local area networks, digital broadcasting, and intelligent transportation systems, ITS plans to vigorously pursue technology transfer to the private sector through CRADAs and thereby contribute to the rapid commercialization of these new technologies. ITS also plans to commit substantial labratory resources to the development and standardization of new telecommunication technologies.

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